

REMARKS

Claims 1 and 5-8 are pending. By this Amendment, claim 1 is amended. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. § 1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search, in particular as the Examiner alleges on page 2, last line, of the Office Action, that the applied prior art discloses the feature now recited in claim 1; (c) does not present any new claims without canceling a corresponding number of claims; and (d) places the application in better condition for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented as they are in response to a new ground of rejection entered in the previous Office Action. Entry of this Amendment is respectfully requested.

Claims 1 and 5-8 were rejected under 35 USC § 102(b) over Aoki (U.S. Patent 6,387,821). The rejection is respectfully traversed.

Claim 1 recites a method of forming metal wiring in a semiconductor device comprising, *inter alia*, forming an unfinished via hole by removing the low temperature oxide selectively for a prescribed thickness using the first photoresist pattern as a mask, wherein a thickness of the low temperature oxide remaining inside the via hole equals a predetermined thickness of an upper part of a damascene contact.

The Examiner alleges that Figures 3a and 3b of Aoki disclose that the thickness of the HSQ film (insulating layer) 106 remaining inside the via hole is equal to a thickness of an upper part of the damascene contact, i.e. that the thickness of the remaining HSQ film 106 below the unfinished via in Figure 3a is equal to the thickness of the upper part of the damascene opening in Figure 3b. It appears that the Examiner's determination is based only on the appearance of Figures 3a and 3b as there is no disclosure or suggestion in the text of Aoki that this is indeed the relationship of the portions of the T-shaped hole discussed in column 8, lines 31-57.

In fact, Aoki merely discloses in column 8, lines 31-34, that using the resist mask 107, dry etching was conducted to form part of a via hole in the HSQ film 106 and the dry etching was stopped before the bottom of the via hole reached the copper film 105. Aoki further discloses in column 8, lines 42-44, that dry etching was conducted using the resist mask 108

to form a hole having the T-shaped section. However, there is no disclosure or suggestion that the thickness of the portion of the HSQ film 106 below the unfinished via hole in Figure 3a is equal to the thickness of the upper part of the T-shaped hole in Figure 3b.

MPEP § 2125 states: "When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value."

It is respectfully submitted that the Examiner's determination that Aoki discloses the feature of claim 1 that the thickness of the low temperature oxide remaining inside the via hole equals a predetermined thickness of an upper part of a damascene contact is based solely on an interpretation Figures 3a and 3b, as Aoki is completely silent as to any relationship between the thickness of the portion of HSQ film 106 remaining below the unfinished via hole and the thickness of the upper part of the damascene contact. As Aoki does not disclose that the drawings are to scale and is silent as to the dimensions, it is respectfully submitted that the Examiner's determination is entitled to little value, and certainly does not arise to the level required to present a *prima facie* case of anticipation.

With respect to the Examiner's arguments on page 4, lines 9-13, that Applicant's arguments regarding obtaining a desired sheet resistance have been noted but not considered a "critical" aspect of the invention because the arguments were not included in the specification as originally filed, it is respectfully noted that MPEP § 716.02(f) states: "The totality of the record must be considered when determining whether a claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made. Therefore, evidence and arguments directed to advantages not disclosed in the specification cannot be disregarded."

MPEP § 716.02(f), in discussing In re Chu, 66 F.3d 292, 298-99, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995) further states: "We have found no cases supporting the position that a patent applicant's evidence or arguments traversing a § 103 rejection must be contained within the specification. There is no logical support for such a proposition as well, given that obviousness is determined by the totality of the record including, in some instances most significantly, the evidence and arguments proffered during the give-and-take of *ex parte* patent prosecution."

Although the MPEP sections discussed above refer to the determination of obviousness, it is respectfully submitted that they are equally applicable to the determination of anticipation, especially as lack of novelty is the ultimate determination of obviousness. In

other words, there is nothing in 35 U.S.C. § 102 that requires that Applicant's arguments regarding novelty be limited to those features of the invention explicitly disclosed in the specification as originally filed.

It is further respectfully submitted that there is no requirement in 35 U.S.C. § 102 that the novel aspects of a claimed invention be "critical," or disclosed in the specification as originally filed as "critical." Novelty merely requires that the claimed invention not be disclosed expressly or inherently in a single prior art reference. See MPEP § 2131.

With respect to the Examiner's arguments that the claimed thickness of the low temperature oxide remaining inside the via hole being equal to a predetermined thickness of an upper part of a damascene contact is no more than a preferred relationship, it is again respectfully submitted that the determination of anticipation is not predicated on what Applicant may, or may not, disclose as a preferred embodiment of his invention. However, as disclosed, the claimed thickness relationship is preferred because it permits enhancement of the yield to be maximized, which is neither disclosed nor suggested by Aoki and demonstrates the claimed invention's novelty and non-obviousness over the prior art.

With respect to the HSQ film 106 of Aoki, claim 1 recites that the low temperature oxide is formed by deposition. The HSQ film 106 of Aoki is a flowable material, and is formed as a spun-on-glass (SOG). See column 5, lines 40-42 of Aoki. It is further respectfully noted that Aoki do not disclose or suggest forming the HSQ film at 150-500°C, as recited in claim 1. Aoki disclose in column 8, lines 23-25, that the HSQ film was coated and then heat treated at 150°C, 250°C, and 350°C. Aoki do not disclose or suggest the temperature at which the HSQ film 106 is formed. Aoki discloses the temperature at which the already formed (coated) HSQ film 106 is heat treated.

Claims 2 and 5-8 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1 and 5-8 are respectfully requested.

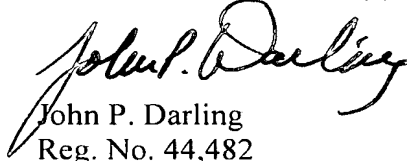
In view of the above amendments and remarks, it is respectfully submitted that all of the claims are allowable and that the entire application is in condition for allowance.

BAE -- 10/626,550  
Attorney Docket: 040021-0305239

Should further issues require resolution prior to allowance, the Examiner is requested to telephone the undersigned at the number below.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "John P. Darling", is written over the printed name.

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